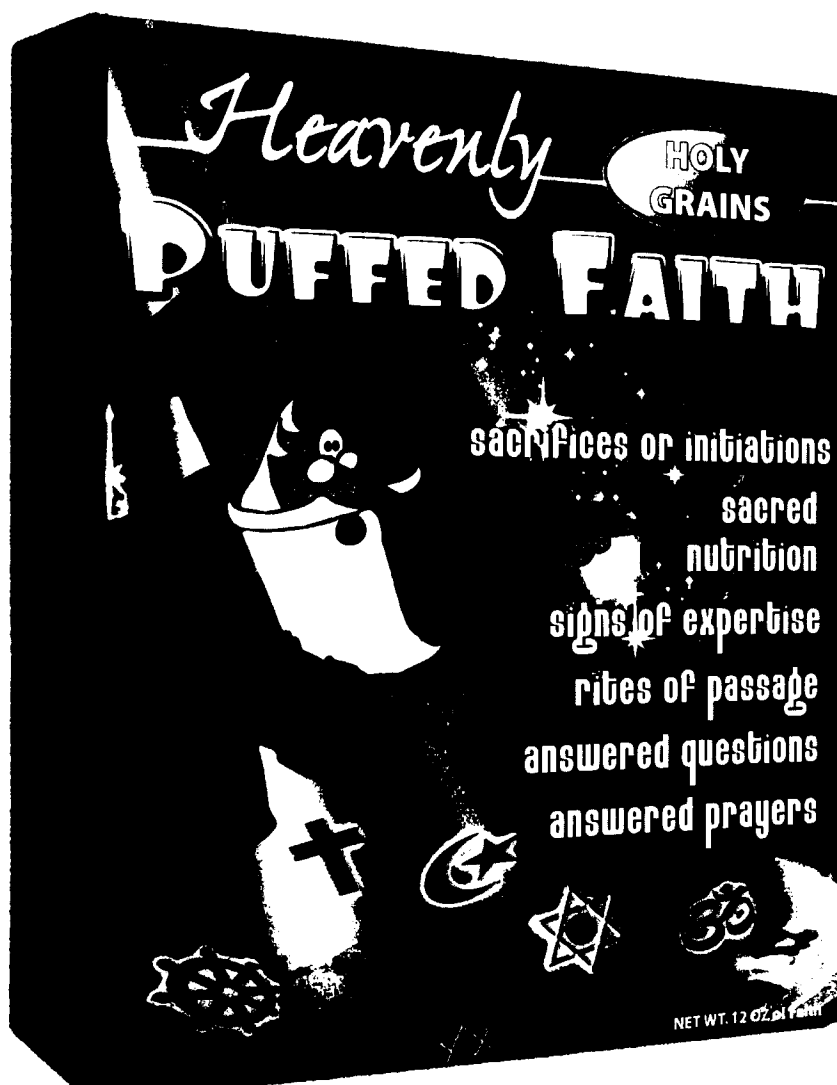


The Evolutionary Psychology of Religion



WHEN I FIRST BEGAN to write about the biology of the human mind, I found myself the target of attacks from many directions. The academic left went after me because I seemed to be denying the perfectibility of humankind and the biological indistinguishability of all people. The religious right sent flaming arrows in my direction because I argued for evolution and denied the existence of an immaterial soul.

Now, you can't write honestly about human beings if you just want to be popular. And I certainly don't believe that a biological understanding of human nature is inconsistent with a commitment to moral principles and a hope that we can improve our condition—on the contrary, I think a better understanding of what makes us tick puts these principles on a firmer foundation. But it did feel a bit lonely to be vilified from so many directions. Then a few years ago I made a welcome discovery. I wasn't alone—I was a Humanist! It was therefore a tremendous honor and especially touching to be named 2006 Humanist of the Year by the American Humanist Association.

One of the questions I am asked most often is one I suspect stumps many Humanists: why is religious belief still so widespread? Do we have a "God gene" or a "God module"? I'm referring to claims like those made in a *Time* magazine cover story last year called "The God Gene," in which the

question was asked, "Does our DNA compel us to seek a higher power?"

Believe it or not, some scientists say yes." A number of years earlier, claims were made that the human brain is equipped with a "God module," a subsystem of the brain shaped by evolution to cause us to have a religious belief ("Brain's God Module May Affect Religious Intensity," ran the headline of the *Los Angeles Times*).

of Religion

by Steven Pinker

There certainly is a phenomenon that needs to be explained, namely religious belief. According to surveys by ethnographers, religion is a human universal. In all human cultures, people believe that the soul lives on after death, that ritual can change the physical world and divine the truth, and that illness and misfortune are caused and alleviated by a variety of invisible person-like entities: spirits, ghosts, saints, demons, cherubim or Jesus, devils and gods.

All cultures, you might ask? Yes, all cultures. I give you an example of a culture we're well familiar with, that of the contemporary United States. The last time I checked the figures, 25 percent of Americans believe in witches, 50 percent in ghosts, 50 percent in the devil, 50 percent believe that the Book of Genesis is literally true, 69 percent believe in angels, 87 percent believe Jesus was raised from the dead, and 96 percent believe in a god or a universal spirit. Humanists have their work cut out for them!

So what's going on? In many regards, the human mind appears to be well engineered. It's not literally well engineered, of course, but it has the *signs* or appearance of engineering in the biologist's sense. That is, we can see, think, move, talk, understand, and attain goals better than any robot or computer. You can't go to Circuit City and buy Rosie the Maid from *The Jetsons* and expect it to put away the dishes or run simple errands. These feats are too difficult for human-made creations, though they're things that a five-year-old child could do effortlessly. The explanation for signs of engineering in the natural world is Charles Darwin's theory of natural selection, the only theory we've come up with so far that can explain the illusion of design in causal terms.

The question is, how can a powerful taste for apparently irrational beliefs evolve? H.L. Mencken said that "the most common of all follies is to believe passionately in the pal-

pably not true. It's the chief occupation of mankind." This poses an enigma to the psychologist.

But perhaps religious belief could be an adaptation. Many of our faculties are adaptations to enduring properties of the real world. We have depth perception because the world really is three dimensional. We apparently have an innate fear of snakes, because the world has snakes and they are venomous. So maybe there really is a personal, attentive, invisible, miracle-producing, reward-giving, retributive deity, and we have a God module in order to commune with him.

As a scientist, I like to interpret claims as testable hypotheses, and this certainly is one. It predicts, for example, that miracles should be observable, that success in life should be proportional to virtue, and that suffering should be proportional to sin. I don't know anyone who has done the necessary studies, but I would say there is good reason to believe that these hypotheses have not been confirmed. There's a Yiddish expression: "If God lived on earth, people would break His windows."

There have been other, more plausible attempts to explain religion as a biological adaptation. Even though I'm far more sympathetic to Darwinian explanations of mental life than most psychologists, I don't find any of these convincing. Let's review them.

The first is that religion gives comfort. The concepts of a

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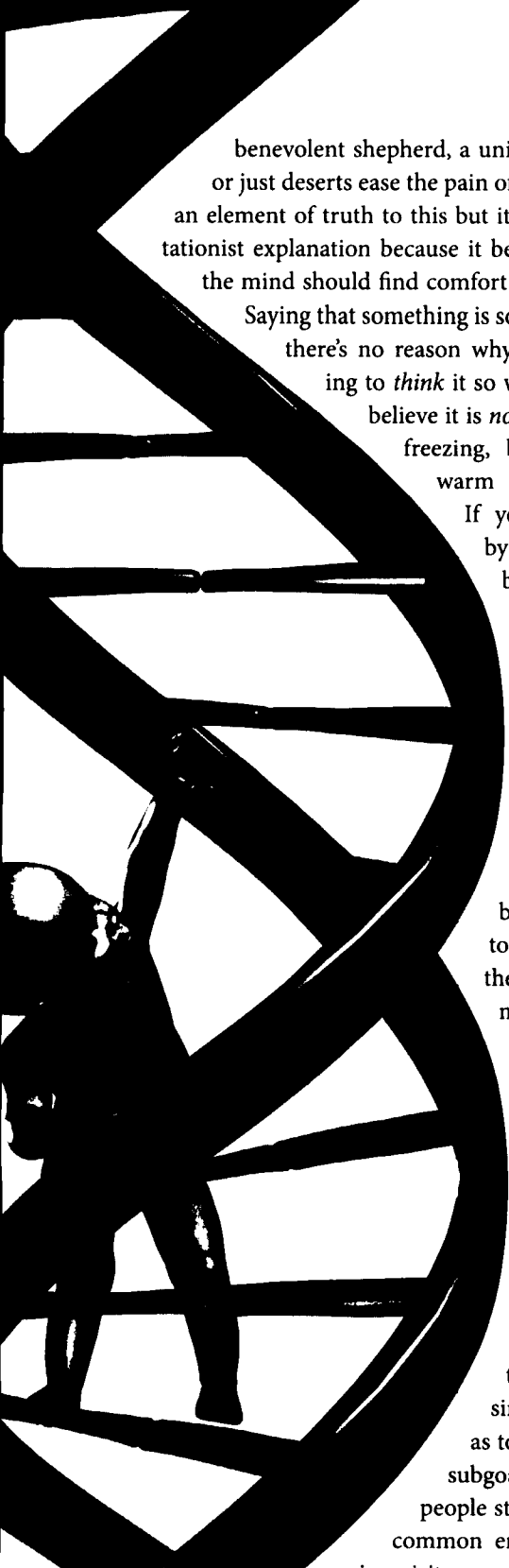
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benevolent shepherd, a universal plan, an afterlife, or just deserts ease the pain of being a human. There's an element of truth to this but it isn't a legitimate adaptationist explanation because it begs the question of *why* the mind should find comfort in beliefs that are false.

Saying that something is so doesn't make it so, and there's no reason why it should be comforting to *think* it so when we have reason to believe it is *not* so. Compare: if you're freezing, being told that you're warm isn't terribly soothing.

If you're being threatened by a menacing predator, being told that it's just a rabbit isn't particularly comforting. In general, we aren't that easily deluded. Why should we be in the case of religion? It simply begs the question.

The second hypothesis is that religion brings a community together. Those who read the cover story of *Time* might be familiar with this hypothesis because the geneticist Dean Hamer, whose new book *The God Gene* inspired the cover story, offered this as his Darwinian explanation of religion. Religion certainly does bring a community together. But, again, it simply begs the question as to *why*. Why, if there is a subgoal in evolution to have people stand together to face off common enemies, would a belief in spirits or a belief that ritual could change the future be necessary to cement a community together? Why aren't emotions like trust and loyalty and friendship and solidarity enough? There's no a priori reason to expect that belief in a soul or a ritual would solve the problem of how to get a bunch of organisms to cooperate.

The third spurious explanation is that religion is the source of our higher ethical yearnings. Those of you who read the book *Rock of Ages* by Steven Jay Gould, who argued that religion and science could co-exist comfortably, are familiar with his argument: since science can't tell us what our moral values should be, that's what religion is for, and each "magisterium" should respect the other. A big problem with this hypothesis is apparent to anyone who has read the Bible, which is a manual for rape and genocide and destruction. God basically tells the Israelites invading all Midianite villages, "Kill all the men, kill all the kids, kill all the old women. Take the young women that you find attractive, bring them back to your compound, shave their heads, lock them in a room for thirty days till they stop crying their eyes out because you've killed their mothers and fathers, and then take each as a second or third or fourth or fifth wife." So the Bible, contrary to what a majority of Americans apparently believe, is far from a source of higher moral values. Religions have given us stonings, witch-burnings, crusades, inquisitions, jihads, suicide bombers, gay-bashers, abortion-clinic gunmen, and mothers who drown their sons so they can happily be united in heaven.

To understand the source of moral values, we don't have to look to religion. Psychologists have identified universal moral sentiments such as love, compassion, generosity, guilt, shame, and righteous indignation. A belief in spirits and angels need not have anything to do with it. And moral philosophers such as Peter Singer who scrutinize the concept of morality have shown that it is logically rooted in the interchangeability of one's own interests and others. The world's enduring moral systems capture in some way the notion of the interchangeability of perspectives and interests, the idea that "I am one guy among many"; the golden rule; the categorical imperative; Singer's own notion of "the expanding circle"; John Rawls' "veil of ignorance"; and so on. A retributive, human-like deity meting out justice doesn't have a role in our best explanations of the logic of morality.

To answer the question, why is *Homo sapiens* so prone to religious belief? you first have to distinguish between traits that are *adaptations*, that is, products of Darwinian natural selection, and traits that are *byproducts* of adaptations, also called spandrels or exaptations. An example: Why is our blood red? Is there some adaptive advantage to having red blood, maybe for camouflage amid autumn leaves? Well, that's unlikely, and we don't need any other adaptive explanation, either. The explanation for why our blood is red is that it is adaptive to have a molecule that can carry oxygen, mainly hemoglobin. Hemoglobin happens to be red when it's oxygenated, so the redness of our blood is a

byproduct of the chemistry of carrying oxygen. The color per se was not selected for. Another non-adaptive explanation for a biological trait is genetic drift. Random stuff happens in evolution. Certain traits can become fixed through sheer luck of the draw.

To distinguish an adaptation from a byproduct, first of all you have to establish that the trait is in some sense innate, for example, that it develops reliably across a range of environments and is universal across the species. That helps rule out reading, for example, as a biological adaptation. Kids don't spontaneously read unless they are taught. Spoken language, on the other hand, is a plausible adaptation, because it does emerge spontaneously in all normal children in all societies.

The second criterion is whether the causal effects of the trait would, on average, have improved the survival or reproduction of the bearer of that trait in an ancestral environment—the one in which our species spent most of its evolutionary history, namely the foraging or hunter-gatherer lifestyle that predated the relatively recent invention of agriculture and civilization.

Crucially, the advantage must be demonstrable by some independently motivated causal consequences of the putative adaptation. That is, the laws of physics or chemistry or engineering have to be sufficient to establish that the trait would be useful. The usefulness of the trait can't be invented ad hoc; if it is, you don't have a legitimate evolutionary explanation but a "just-so story" or fairy tale. The way to tell them apart is to independently motivate the usefulness of the trait. An example, via projective geometry: one can show that, by combining images from two cameras or optical devices, it is possible to calculate the depth of an object from the disparity of the projections. If you write out the specs for what you need in order to compute stereoscopic depth, you find that humans and other primates seem to have exactly those specs in our sense of stereoscopic depth perception. It's exactly what engineers would design if they were building a robot that had to see in depth. That similarity is a good reason to believe that human stereoscopic depth perception is an adaptation.

Likewise for fear of snakes. In all societies people have a wariness of snakes; one sees it even in laboratory-raised monkeys who have never seen a snake. We know from herpetology that snakes were prevalent in Africa during the time of our evolution, and that getting bitten by a snake is not good for you because of the chemistry of snake venom. Crucially, that itself isn't a fact of psychology, but it helps to establish that what is a fact of psychology, namely the fear of snakes, is a plausible adaptation.

Our sweet tooth is yet another example. It's not terribly

adaptive now, but biochemistry has established that sugar is packed with calories and therefore could have prevented starvation in an era when food sources were unpredictable. That makes a sweet tooth a plausible adaptation.

In contrast, it's not clear what the adaptive function of humor is, or of music. I think the explanations of religion that I've reviewed have the same problem, namely not having an independent rationale, given an engineering analysis of why that trait should, *in principle*, be useful.

The alternative then is that, just as the redness of blood is a byproduct of other adaptations, so may be our predisposition to religious belief. A crucial corollary of the theory of evolution is that conflicts of interest among organisms, of different species or of the same species, lead to the biological equivalent of an arms race. An organism evolves more clever or lethal weapons, another organism evolves even more ingenious defenses, and so on, spiraling the process. At any given stage in an arms race a feature can be adaptive for one organism but not for its adversaries, as long as the first is overcoming the defenses of the second. That's another reason why not everything in biology is adaptive, at least not for every organism. What's adaptive for the lion is not so adaptive for the lamb.

So a way of rephrasing the question, why is religious belief so pervasive? is to ask, who benefits? Here one must distinguish the possible benefits of religion to the *producers* of religious belief—the shamans and priests and so on—from the benefits to the *consumers* of religion—the parishioners, the flock, the believers. And so we ask, what good is an inculcation of religious belief by priests, shamans, and so on? What good is an acceptance of religious belief by believers?

A number of anthropologists have pointed out the benefits of religion to those causing *other* people to have religious beliefs. One ubiquitous component of religion is ancestor worship, which must sound pretty good if you're getting on in years and can foresee the day when you're going to become an ancestor. Among the indignities of growing old is that you know you aren't going to be around forever. If you plausibly convince other people that you'll continue to oversee their affairs even when you're dead and gone, that will give them an incentive to treat you nicely up

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to the last day.

Food taboos are also common in religious belief, and might be explained by the psychology of food preference and dispreference, in particular, disgust. If you withhold a food, especially a food of animal origin, from children during a critical period, they'll grow up grossed out at the thought of eating that food. That's why most of us wouldn't eat dog meat, monkey brains, or maggots—things that are palatable in other societies. There are often ecological reasons why food taboos develop, but there are probably also reasons of control. Since neighboring groups have different

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avored foods, if you keep your own kids from having a taste for the foods favored by your neighbors, it can keep them inside the coalition, preventing them from defecting to other coalitions, because to break bread with their neighbors they'd have to stomach revolting fare.

Rites of passage are another intelligible feature of religion. Many social decisions have to be made in categorical, yes-or-no, all-or-none fashion even though a lot of our biology is fuzzy and continuous. A child doesn't go to bed one night and wake up an adult the next morning. But we do have to make decisions such as when they can vote or drive or buy a gun. There's nothing magical about the age of thirteen or the age of eighteen or any other age. It's simply more convenient to anoint a person as an adult on a particular, arbitrarily chosen day than to haggle over how mature every individual is every time he or she wants a

beer. Religious rites of passage demarcate stages of life, serving the function that we have given over to driver's licenses and other forms of ID. Another fuzzy continuum is whether someone is available as a potential romantic partner or is committed to

someone else. Marriage is a useful way of demarcating that continuum with a sharp line.

Costly initiations or sacrifices are also present in almost all the world's religions. A general problem in the maintenance of cooperation is how to distinguish people who are altruistically committed to a coalition from hangers-on and parasites and free-riders. One way to test who's genuinely committed is to see who is willing to undertake a costly sacrifice. For example, the test of commitment for a certain ethnic group I'm familiar with says, "You've just had a baby. Please hand over your son so I can cut some skin off his penis." That's not the kind of thing that anyone would do unless they took their affiliation with the group seriously. And there are far more gruesome examples from the rest of the world.

Yet another explicable feature of religion are signs of expertise in occult knowledge. If you're the one who knows mysterious but important arcane knowledge, then other people will defer to you. Even in nonreligious contexts, most societies have some division of labor in expertise, where prestige and perquisites are accorded to people who know useful things. So a good strategy for providers of religion is to mix some genuine expertise—and indeed, anthropologists have shown that the tribal shaman or witch doctor really is an expert in herbal medicine and folk remedies—with a certain amount of hocus-pocus, trance-inducing drugs, stage magic, sumptuous robes and cathedrals, and so on, reinforcing the claim that there are worlds of incomprehensible wonder, power, and mystery that are reachable only through the religious provider's services.

These practical benefits take away some of the mystery of why people like to encourage religious belief in others, without committing oneself to a specific biological adaptation for religion. The inculcation of religious belief would be a byproduct of these other, baser, motives.

What about the other side of these transactions, namely the consumers? Why do they buy it? One reason is that in most cases we *should* defer to experts. That's in the very nature of expertise. If I have a toothache I open my mouth and let someone drill my teeth. If I have a bellyache I let someone else cut me open. That involves a certain amount of faith. Of course, in these cases, the faith is rational, but that deference could, if manipulated, lead to *irrational* deference, even if the larger complex of deference can be adaptive on the whole.

There are also emotional predispositions that evolved for various reasons and make us prone to religious belief as a byproduct. The anthropologist Ruth Benedict summed up much of prayer when she said, "Religion is universally a technique for success." Ethnographic surveys suggest that

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when people try to communicate with God, it isn't to share gossip or knowhow; it's to ask for stuff: recovery from illness, recovery of a child from illness, success in enterprises, success on the battlefield, (and of course for the Red Sox to win the World Series, which almost made me into a believer). This idea was summed up by Ambrose Bierce in *The Devil's Dictionary*, which defines "to pray" as "to ask that the laws of the universe be annulled in behalf of a single petitioner, confessedly unworthy." This aspect of religious belief is thus a desperate measure that people resort to when the stakes are high and they've exhausted the usual techniques for the causation of success.

Those are some of the emotional predispositions that make people fertile ground for religious belief. But there are also cognitive predispositions, ways in which we intellectually analyze the world, which have been very skillfully explored by the anthropologists Dan Sperber, Pascal Boyer, and Scott Atran. Anyone who is interested in the evolutionary psychology of religion would enjoy Pascal Boyer's *Religion Explained* and Scott Atran's *In Gods We Trust*. Hamer's book *The God Gene* is also good, but I'm more sympathetic to Boyer and Atran.

The starting point is a faculty of human reason that psychologists call intuitive psychology or the "theory of mind module"—"theory" referring not to a theory of the scientist but rather to the *intuitive* theory that people unconsciously deploy in making sense of other people's behavior. When I try to figure out what someone is going to do, I don't treat them as a robot or a windup doll responding to physical stimuli in the world. Rather, I impute *minds* to those people. I can't literally know what someone else is thinking or feeling, but I assume that they're thinking or feeling something, that they have a mind, and I explain their behavior in terms of their beliefs and their desires. That's intuitive psychology. There is evidence that intuitive psychology is a distinct part of our psychological makeup. It seems to be knocked out in the case of autism: autistic people can be prodigious in mathematics, art, language, and music but they have a terrible time attributing minds to other people. They really do treat other people as if they were robots and windup dolls.

There's also a concerted effort underway to see where intuitive psychology is computed in the brain. Part of it seems to be concentrated in the ventromedial and orbital frontal cortex, the parts of the brain that kind of sit above the eyeballs, as well as the superior temporal sulcus farther back.

Perhaps the ubiquitous belief in spirits, souls, gods, angels, and so on consists of our intuitive psychology running amok. If you're prone to attributing an invisible entity called "the mind" to other people's bodies, it's a short step

to imagining minds that exist *independently* of bodies. After all, it's not as if you could reach out and touch someone else's mind; you are always making an inferential leap. It's just one extra inferential step to say that a mind is not invariably housed in a body.

The nineteenth-century anthropologist Edward Tyler pointed out that, in some ways, there is good empirical support for the existence of the soul. Think about dreams. When you dream, your body is in bed the whole time but some part of you seems to be up and about in the world. The same thing happens when you're in a trance from a fever, a hallucinogenic drug, sleep deprivation, or food poisoning.

Shadows and reflections are rather mysterious, or were until the development of the physics of light with its explanation of those phenomena. But they appear to have the form and essence of the person but without any of her or his actual matter.

Death, of course, is the ultimate apparent evidence for the existence of the soul. A person may be walking around seeing and hearing one minute, and the next minute be an inert and lifeless body, perhaps without any visible change. It would seem that some animating entity that was housed in the body has suddenly escaped from it.

So before the advent of modern physics, biology, and especially neuroscience, a plausible explanation of these phenomena was that the soul wanders off when we sleep, lurks in the shadows, looks back at us from a surface of a pond, and leaves the body when we die.

Taken as a whole, the universal propensity toward religious belief is a genuine scientific puzzle and many adaptationist explanations for religion don't meet the criteria for adaptations. There is an alternative explanation, namely that religious psychology is a byproduct of many parts of the mind that evolved for other purposes. There may be emotional adaptations in our desire for power, control, health, love, and success; possible cognitive adaptations in our intuitive psychology; and many aspects of our experience that seem to provide evidence for souls. Put these together and you get an appeal to a mysterious world of souls to bring about our fondest wishes. ☐

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